

IN BRIEF

This volume of the LLE Review, covering the period April–June 1986, contains reports on GDL and OMEGA laser activities; analysis of neutron diagnostic methods of compressed laser targets; modeling of nonlocal heat flow in laser-heated plasmas; and developments in advanced technology areas at LLE: protective polymeric coatings for nonlinear optical materials, time-resolved observation of electron-phonon relaxation in copper, and noncontact electro-optic sampling of high-speed electrical waveforms with a gallium-arsenide injection laser. Finally, the National Laser Users Facility activities for this period are summarized.

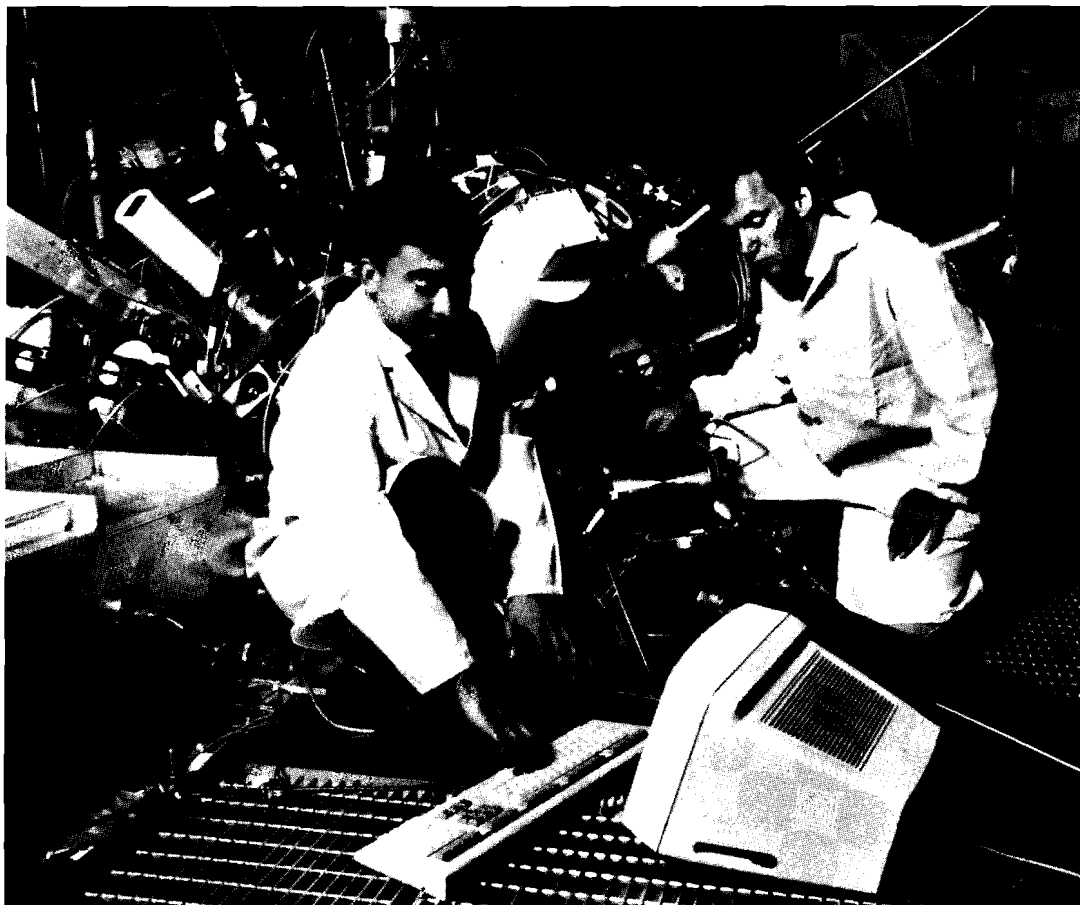
The following are highlights of the research reports contained in this issue:

- A method has been developed for measuring the ρR product of laser-compressed targets. The method involves doping the DT fuel with the isotope ^{80}Kr , which is activated by the fusion-generated neutrons via the $(n, 2n)$ reaction to yield $^{79\text{m}}\text{Kr}$ whose γ decay is counted following the capture of target debris. The method is compared with those involving (a) activation of the glass shell and (b) neutron scattering of fuel ions.
- A model for treating nonlocal effects in heat transport due to long mean-free-path electrons was developed and compared to hydrodynamic code results, which do not include these effects. Nonlocal effects were found to be insignificant in the heat transport of laser-generated plasmas.

- An organosilicone resin was found to be useful for the deposition of laser-damage-resistant, antireflectance or protective coatings on KDP, lithium niobate, and potassium pentaborate. The availability of multilayer dielectric thin-film coatings on these nonlinear optical materials, using high laser-damage resistance and good mechanical and environmental durability will be very useful in the harmonic conversion of high-power lasers where now complex geometries, involving index-matching fluids, have to be used.
- Electron-phonon relaxation time in copper has been directly measured by monitoring the laser-heating-induced modulation of the transmissivity of thin copper films. Nonequilibrium heating with a large difference between electron and lattice temperatures has been demonstrated.
- The ability to make noncontact measurements of electrical waveforms with 30-ps diode-laser pulses has been demonstrated. This electro-optic sampling method utilizes a substrate-independent probe and is inexpensive and practical.

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Lead experimental engineer Gregory Pien (left) and OMEGA experimental group leader Martin Richardson (right) survey the computer-controlled, rapid-retraction system for nuclear activation analysis of target debris.